



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY-DOCKET NO.	CONFIRMATION NO.
09/494,945	02/01/2000	Tadahiro Ohmi	862.C1811	4149

5514 7590 08/01/2002

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

FLORES RUIZ, DELMA R

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 08/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/494,945	OHMI ET AL.	
	Examiner	Art Unit	
	Delma R. Flores Ruiz	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.


- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) 67-108 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


PAUL IP
 SUPERVISORY PATENT EXAMINER
 TECHNOLOGY CENTER 2800

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>8</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments with traverse

Applicant's election with traverse of 1-66 in Paper No. 10 is acknowledged. Applicant's election with traverse of claims 1 – 66 drawn to a laser oscillating apparatus in Paper No. 10 is acknowledged. The traversal is on the ground(s) that the applicant's submit that the various embodiments are so closely related as to not require separate field of search and a duplicative search. This is not found persuasive, because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

The is not found persuasive because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II and III, restriction for examination purposes as indicated is proper.

This application contains claims 67 – 108 drawn to an invention nonelected with traverse in Paper No. 10. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Drawings

Figures 56A, 56B and 57 are should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1 - 66 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: In claims 1 – 3, the recitations of "the uniformizing mean for uniformizing an intensity distribution of laser emission in an excitation region of said laser gas and uniformizing mean for uniformizing a density distribution of a plasma in an excitation region of said laser gas" makes said claim incomplete since it is not clear from the disclosed how the recited means are arranged in a way to constitute the claimed apparatus. The examiner that

from the way the claim is disclosed, said claim recitations couldn't even be drawn to represent a structure also notes it. The applicant is advised to rephrase the above-mentioned claim in order to clarify its scope.

Claims 1 – 66 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: One of ordinary skill in the art will not understand the apparatus since the components of the apparatus are not clearly stated at the claim as a complete structure.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily

published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1 – 11, 14 – 25, 27 – 53, 57 – 60, and 63 – 66, which has a common assignee and three inventors with the instant application.

Based upon the earlier effective U.S. filing date of the copending application, it would constitute prior art under 35 U.S.C. 102(e), if patented. This provisional rejection under 35 U.S.C. 102(e) is based upon a presumption of future patenting of the copending application.

This provisional rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the copending application was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

This rejection may not be overcome by the filing of a terminal disclaimer. See *In re Bartfeld*, 925 F.2d 1450, 17 USPQ2d 1885 (Fed. Cir. 1991).

Regarding claims 1 – 3, 19, 53 – 56, 58 – 62, and 64 Ohmi et al discloses a laser oscillating apparatus for generating a laser beam by introducing an electromagnetic wave (Column 12, lines 22 – 30) into a laser tube (Fig. 8A, Character 2) filled with a laser gas through a plurality of slots (Figs. 9A, 9B, and 9C, Column 12, lines 22 – 30) formed in a waveguide wall, comprising: uniformizing mean for uniformizing an intensity distribution of said electromagnetic wave in an excitation region of said laser gas, the uniformizing mean for uniformizing an intensity distribution of laser emission in an excitation region of said laser gas and uniformizing mean for uniformizing a density distribution of a plasma in an excitation region of said laser gas. The slots comprises a plurality of rows of slits, and the width of each slit is made smaller than the thickness of a sheath serving as a passage of said electromagnetic wave. Uniformizing means is formed such that a pair of waveguides are formed to sandwich said laser tube such that formation surface of said slots oppose each other, identical electromagnetic wave are supplied to said pair of waveguides to excite a laser gas in two opposite directions on said laser tube, and said pair of waveguides are constructed such that intensity distributions of electromagnetic wave introduced therefrom are shifted from said other. The formation surface of said slots are short end faces of said waveguide, and said slots are formed in a line at equal intervals in a longitudinal direction said slots and the waveguide are arranged such that slots corresponding to A predetermined distance shifts each other between the opposing formation surfaces relative to each other. A phase adjusting means for shifting phases of

electromagnetic wave supplied into said waveguide relative to each other. Waveguides comprises tuning means for tuning an electromagnetic wave (Figs. 3A-C, 4A-B, 8A, 9A-C, 11A – 14, 16A, 17A – 23A, Column 13, lines 30 – 35, 62 – 67, Column 14, lines 1 – 5, Column 19, lines 15 – 20, and Column 16, lines 5 – 13, 19 – 23).

Regarding claim 4, Ohmi discloses a uniformizing means is formed such that said slot are spaced apart from a wall of said laser tube by a predetermined distance and an electromagnetic wave passage is formed in a portion spacing said slot apart from said laser tube and connects said slots apart from said laser tube such that electromagnetic waves introduced from said plurality of slot can overlap with each other (Fig. 8A, 9A-C).

Regarding claims 5, 6, 14, 40, and 65, Ohmi discloses the distance from said slots to said laser tube wall is an integral multiple of the half-wave length of an electromagnetic wave introduced from said waveguide, an waveguide electromagnetic wave introduced from said waveguide is a microwave (Figs 6A, 6B, Abstract, and Column 12, lines 22 – 30)

Regarding claims 7, 8, 9, 12 – 13, and 17, Ohmi discloses a passage is made from a conductor, and at least a portion where said passage is in contact with said laser tube, said passage forms an air gap having an opening with a predetermined width over

the length of said laser and air gap is filled with a dielectric member (Column 13, lines 47 – 61, and Column 17, lines 23 – 30).

Regarding claim 10, 11, and 25 Ohmi discloses a dielectric member comprises a plurality of dielectric member having different dielectric constants and the width of said air gap is an integral multiple of the half-wave length of an electromagnetic wave introduced from said waveguide and uniformizing means is formed such that an air gap structure is formed in said waveguide wall in which said slots are formed (Figs. 5, 6A and 6B, Column 12, lines 22 – 30, Column 13, lines 1 – 4).

Regarding claim 15 Ohmi discloses a width of said wide portion changes along a longitudinal direction of said air gap on the basis of an intensity distribution of electromagnetic waves emitted from said slot (Column 13, lines 30 – 35).

Regarding claims 16, Ohmi discloses a dielectric lenses each having a curved shape corresponding to said slot are formed in said passage in at least a portion above said plurality of slot (Figs 9A-C, 16A).

Regarding claims 18, 21, 24, 30, 34, 36, 41, 49, 52, 57, and 66 Ohmi discloses a laser gas id one of at least one inert gas selected from the group consisting of Kr, Ar, He

and Ne and a gas mixture of said inert gas and F₂ gas (Abstract, Column 1, lines 21 – 27 and Column 3, lines 17 – 24).

Regarding claim 20, and 28 Ohmi discloses an end portions have circular shapes with a diameter larger than the width of said central portion and air gap structure in a central portion of said slot is made smaller than an air gap portion near end portions of said slot (Figs. 2, 11B).

Regarding claims 22, 23, 35 and 37 – 39 , Ohmi discloses uniformizing means is formed such that said slot are formed apart from a central axis along a longitudinal direction of said wavelength and each of said slots is curved such that end portion are closer to the central axis than a central portion, the electromagnetic wave is radiated from said waveguide in the direction off a long end face of said waveguide and uniformizing means is formed such that width of end portions in a longitudinal direction of said slot is made smaller than the width of a central portion thereof. The uniformizing means is formed such that said slot formed in a portion where an emission characteristic of an electromagnetic wave depending on said slot is contrary to an intensity distribution of an electromagnetic wave propagating in said waveguide. The slot is formed such that a minimum value of an intensity distribution of an electromagnetic wave propagating in said waveguide is in substantially the center of said slot and slot are formed in a line at a pitch equal to one of the wavelength and the

half-wave length of an electromagnetic wave in said waveguide (Figs 6A, 6B. 8A, 11A 12 A, Column 12, lines 1 – 6, Column 13, lines 30 – 35).

Regarding claims 26 – 27, and 29 Ohmi discloses the air gap structure includes an air gap portion formed near end portions of said within a range from said end portions to a distance and air gap structure is formed with a width equal to an integral multiple of $\lambda_g/2$ (λ_g is the waveguide of said electromagnetic wave) (Figs. 6A, and 6B, Column 12, lines 1 – 6).

Regarding claim 31, and 32 Ohmi discloses a uniformizing means is formed such that each of said plurality of slots comprises collecting means for efficiently guiding said electromagnetic wave to said slot and collecting means comprises a slot having a tapered shape whose sectional shape narrows toward said laser tube (Figs. 9A, 9B, and 9C, Column 12, lines 22 – 30).

Regarding claim 33, Ohmi discloses a collecting means comprises a dielectric lens formed with respect to said slot (Fig. 16A and 17A).

Regarding claims 42 – 48, Ohmi discloses a uniformizing means comprises a shielding structure against said electromagnetic wave in said laser tube in order to

prevent said plasma excited above said slots from diffusing from a predetermined region. The shielding structure comprises a metal wall spaced apart from said slot by a predetermined distance, the shielding structure is made from a mesh-like plate member, and shielding structure comprises a plurality of nozzle structure having predetermined opening and nozzle is a passage of said laser gas. The shielding structure is formed by a magnetic field (Column 14, lines 23 – 42).

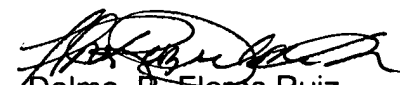
Regarding claims 50, and 51 Ohmi discloses a uniformizing means is formed such that the with in a short-side direction of said slot is made smaller that the thickness of a sheath serving as a passage of said electromagnetic wave extending from an opening of said slot in said short-side direction, and the width in said short-side direction in 10 – 100 μm (Column 2, lines 56 – 62, Column 12, lines 22 - 30).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (703) 308-6238. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.



Delma R. Flores Ruiz
Examiner
Art Unit 2828



Paul Ip
Supervisor Patent Examiner
Art Unit 2828

DRFR/PI
July 23, 2002